High Level Architecture

Overview and Rules

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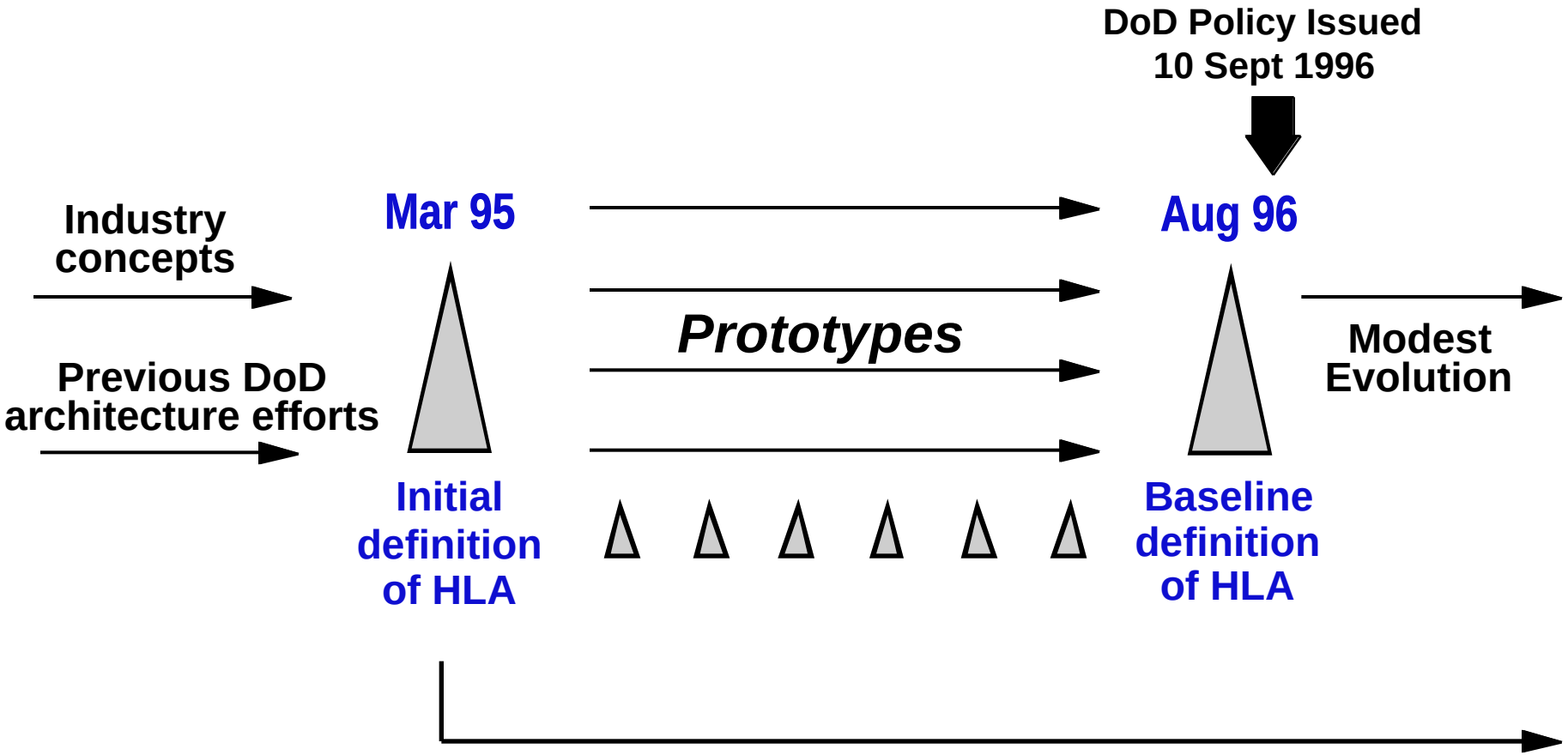
High Level Architecture

- **Major functional elements, interfaces, and design rules, pertaining to all DoD simulation applications, and providing a common framework within which specific system architectures can be defined**

- **HLA is the Technical Architecture for DoD Simulations**

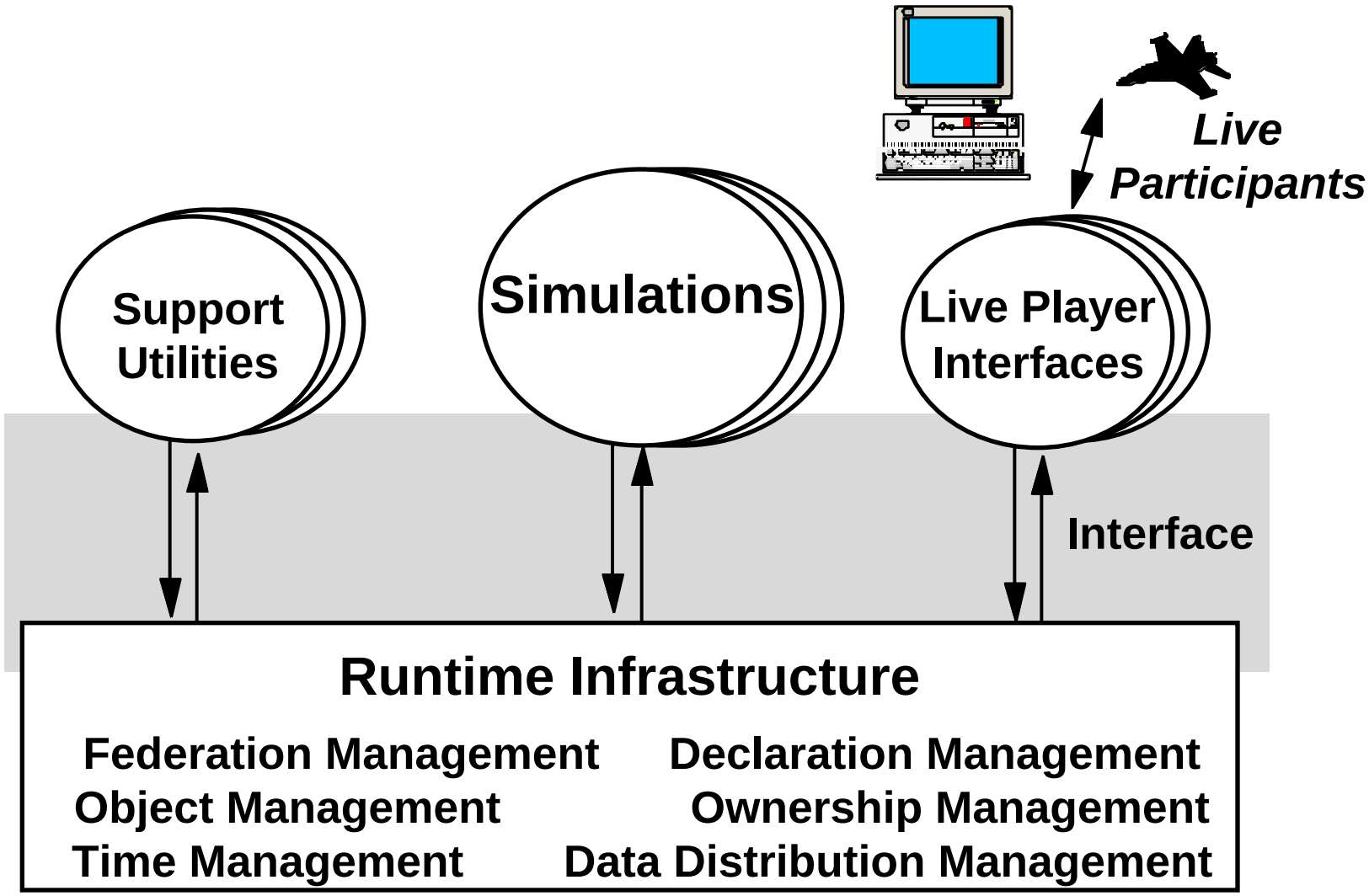
HLA Development Process Overview



Defining the HLA

- **HLA Rules**
  - **A set of rules which must be followed to achieve proper interaction of simulations in a federation. These describe the responsibilities of simulations and of the runtime infrastructure in HLA federations.**
- **Interface Specification**
  - **Definition of the interface functions between the runtime infrastructure and the simulations subject to the HLA.**
- **Object Model Template**
  - **The prescribed common method for recording the information contained in the required HLA Object Model for each federation and simulation.**

Functional View of the Architecture



HLA Object Models and OMT

- **Federation Object Model (FOM)**
  - A description of all shared information (objects, attributes, associations, and interactions) essential to a particular federation
- **Simulation Object Model (SOM)**
  - Describes objects, attributes and interactions in a particular simulation which *can* be used externally in a federation
- **Object Model Template (OMT)**
  - Provides a common framework for HLA object model documentation
  - Fosters interoperability and reuse of simulations and simulation components via the specification of a common representational framework

HLA Rules

- **Ten basic rules that define the responsibilities and relationships among the components of an HLA federation**
  - **Five rules apply to federations**
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Federation Rules

- **Rule 1:**
  - **Federations shall have an HLA Federation Object Model (FOM), documented in accordance with the HLA Object Model Template (OMT).**
- **Rule 2:**
  - **In a federation, all object representation shall be in the federates, not in the runtime infrastructure (RTI).**
- **Rule 3:**
  - **During a federation execution, all exchange of FOM data among federates shall occur via the RTI.**

Federation Rules

- **Rule 4:**
  - **During a federation execution, federates shall interact with the runtime infrastructure (RTI) in accordance with the HLA interface specification.**
- **Rule 5:**
  - **During a federation execution, an attribute of an instance of an object shall be owned by only one federate at any given time.**

Federate Rules

- **Rule 6:**
  - **Federates shall have an HLA Simulation Object Model (SOM), documented in accordance with the HLA Object Model Template (OMT).**
    - **Each simulation must describe the functionality it is able to provide to a federation in OMT terms**
    - **All SOM objects, attributes and interactions may not be used in any given federation**
      - **SOM describes the array of options available**

Federate Rules

- **Rules 7 - 9: Federates have to abide by the provisions of their SOM**
  - **Federates shall be able to update and/or reflect any attributes of objects in their SOM and send and/or receive SOM object interactions externally, as specified in their SOM. (Rule 7)**
  - **Federates shall be able to transfer and/or accept ownership of attributes dynamically during a federation execution, as specified in their SOM. (Rule 8)**
  - **Federates shall be able to vary the conditions (e.g., thresholds) under which they provide updates of attributes of objects, as specified in their SOM. (Rule 9)**

Federate Rules

- **Rule 10: Time Management**
  - **Federates shall be able to manage local time in a way which will allow them to coordinate data exchange with other members of a federation.**
    - **Simulations in a federation must manage time so that there appears to be one clock**
    - **Internally, a simulation manages time any way it wishes, as long is it meets commitments to other simulations in the federation**